

運動介入が青年女性正常体重肥満者（隠れ肥満者）の 血中脂質，糖代謝，アディポサイトカイン， および心臓自律神経活動機能に及ぼす影響

北海道大学 石井好二郎
 (共同研究者) 同 佐久間一郎
 同 小林範子
 福岡大学 田中宏暁
 京都大学 森谷敏夫

Influence of Exercise Intervention on Blood Lipid Levels, Glycometabolism, Adipocytokines, and Cardiac Autonomic Function in Adolescent Females with Hidden Obesity

by

Kojiro Ishii,
Graduate School of Education, Hokkaido University
 Ichiro Sakuma, Noriko Kobayashi,
Graduate School of Medicine, Hokkaido University
 Hiroaki Tanaka,
Faculty of Sports and Health Science, Fukuoka University
 Toshio Moritani,
Graduate School of Human and Environmental Studies, Kyoto University

ABSTRACT

We performed exercise intervention for 12 weeks in adolescent females (22.3 ± 2.5 yrs: mean \pm SD) with a %fat value of 30% or more (dual energy X-ray absorptiometry: DXA) despite a body mass index (BMI) of less than 25 kg/m^2 , which indicates hidden obesity, and the following results were obtained.

The intensity of exercise was established as the double product break point calculated from heart rate and systolic blood pressure, and the subjects were instructed to exercise for 30 minutes or more per set 3 or more times a week. Six weeks after exercise intervention, the BMI, body fat level, and blood sugar level were lower than those before exercise intervention, and the %fat value was decreased 12 weeks after intervention. However, 12 weeks after intervention, there were no significant decreases in the BMI or body fat level in comparison to those 6 weeks after intervention, whereas the blood sugar level 12 weeks after intervention was significantly increased compared to that 6 weeks after intervention, being similar to the pre-intervention value. Furthermore, cardiac autonomic function (CAF) was negatively correlated with changes in High-frequency and changes in fat (kg), suggesting that exercise-related improvement in CAF is involved in a decrease in %fat.

Exercise performed in this study led to reduction of %fat without decreasing lean body mass. However, the results also suggest that our exercise program should be further improved, considering poor compliance 7 weeks or more after intervention.

要 旨

われわれはbody mass index (BMI) が25kg/m²未満でありながらも体脂肪率(二重エネルギーX線吸収法: DXA法)の30%以上を示す、いわゆる“隠れ肥満”の青年女性(22.3 ± 2.5yrs: mean ± SD)を対象に12週間の運動介入を実施し、以下の結果を得た。

運動は心拍数と収縮期血圧より求められる二重積変曲点(DPBP)の強度とし、1回30分以上、週3回以上実施するよう指示した。運動介入前と比較し、介入6週目でBMI、体脂肪量、血糖値の減少が認められ、介入12週目には体脂肪率の減少が認められた。しかしながら、BMIおよび体脂肪量の6週目から12週目の減少は統計上有意ではなく、血糖値は6週目から12週目で有意に上昇し、介入前の値と差が無くなった。また、心臓自律神経活動機能(CAF)は高周波成分の変化と体脂肪量の変化が負の相関を示した。すなわち、運動によりCAFが改善することが体脂肪率の減少に関係することが示唆された。

本研究の運動は徐脂肪体重の減少を伴うことなく、体脂肪率の減少を示したことから一応の効果を上げたと判断できる。しかし、7週目以降の運動の実施が少なくなるなど、運動プログラムには改善の余地があることも示唆された。